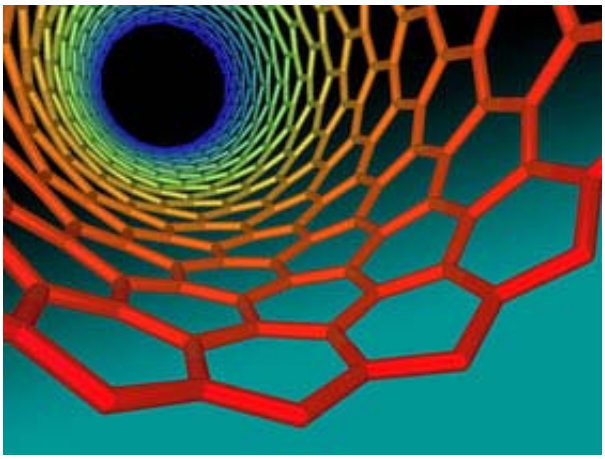
National Nanomanufacturing Network Newsletter

Volume 5 Issue 3 - March 2012

Assessing the Economic Impact of Nanotechnology: The Role of Nanomanufacturing



In developing a strategy for the National Nanotechnology Initiative (NNI), the President's Council of Advisors on Science and Technology (PCAST) have emphasized the need to enable more effective technology transfer and provide added focus on nanomanufacturing and commercialization. These objectives are intended to foster needed economic development within the U.S., while also providing a return on investment (ROI) for the federal government's long-term support of the NNI. While various interpretations can be made from the PCAST reports' (NNI report, Advanced Manufacturing Report) recommendations, one thing is very clear: the linkage between nanomanufacturing and commercialization. While the NNI's investment has had a significant impact on our understanding of nanoscience, and has established the U.S. as the global leader in nanotechnology, nanomanufacturing represents the vehicle by which the innovations of the nanosciences will transition the valley of death towards new and enhanced consumer products. More....

Regards,
National Nanomanufacturing Network

Advertisements

Job Opportunities

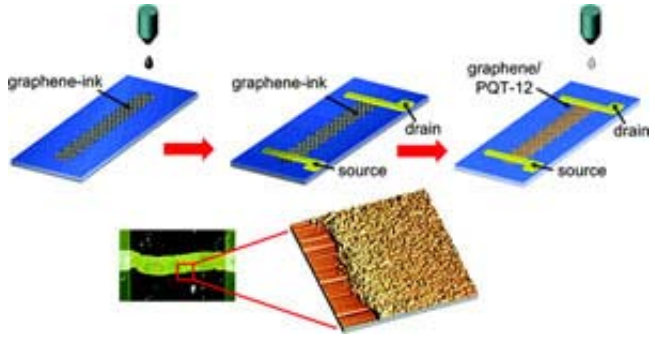
Expected Postdoctoral Opportunities in Nanocomposite Characterization via Fluorescence Imaging, Soft-Matter Single-Molecule Fluorescence Characterization, and Nanocomposite Characterization via Scanning Confocal Raman Spectroscopy
NIST

Analog Circuit Designer
Imec

Post Baccalaureate Fellow
Advanced Light Source, Lawrence Berkeley National Laboratory

Learn More about the National Nanomanufacturing Network

Inkjet-Printed Graphene Flexible Electronics



Electronic devices on flexible substrates has been a growing area for research and development due to rapidly expanding applications and markets for touch screens, electronic paper and displays, photovoltaics, lighting, and sensor tags. To achieve the economy of scale for large area substrates requiring active transistor functionality, the primary focus has been to fabricate the electronics directly on the flexible substrate. A typical drawback of this approach is that the fabrication processes must be compatible with the nominally low-temperature plastic materials that are being considered for the substrates. As a result, the semiconductor materials have relatively poor electronic transport properties, which can translate to large switching voltages, as well other performance limitations such as switching current ON/OFF ratio. The most promising materials and processes to date include thin-film metal oxide materials deposited by moderate temperature processes such as chemical vapor deposition (CVD) or atomic layer deposition (ALD), yet there are still concerns associated with substrate compatibility, throughput, and subsequent process integration for final device and circuit designs. In contrast, a range of semiconducting nanomaterials ink formulations have been studied suitable for coating by techniques such as spin-casting, roll-to-roll processing, or inkjet printing. The problems associated with these materials approaches include stability of ink formulations, control over materials dispersion within coatings, and poor electronic transport properties. For the latter, carrier mobility is in .01-0.1 cm^2/V-sec, with some examples reported in the 30-50 cm^2/V-sec range under

Executive Director, Office for Research Safety
Northwestern University

Upcoming Events

April 4-5, 2012
Nanotech Commercialization Conference

April 9-13, 2012
MRS Spring Meeting 2012

April 10-13, 2012
Graphene 2012

April 16-20, 2012
2012 Energy Materials Nanotechnology Meeting

View Full Calendar

Upcoming Calls

IEEE NANO 2012
Submissions accepted until April 1, 2012

SENN2012 - International Congress on Safety of Engineered Nanoparticles and Nanotechnologies
Submissions accepted until April 1, 2012

Seeing at the Nanoscale 2012
Submissions accepted until: April 10, 2012

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Recently Published

From Our Affiliates

Evaporation-induced cavitation in nanofluidic channels
Proceedings of the National Academy of Sciences of the United States of America

controlled process conditions.
More....

Calculating the Cost of Advanced Manufacturing

For Tim Gutowski, advanced manufacturing is an opportunity not just to boost employment, but also to improve the environment.

The Environmentally Benign Manufacturing group studies the life cycle of new technologies.

Gutowski heads MIT's Environmentally Benign Manufacturing research group, which looks at the environmental costs and impacts associated with manufacturing traditional materials such as concrete and steel, as well as advanced and emerging technologies such as semiconductors, photovoltaics, and nanomaterials such as carbon nanotubes.
More...

National Nanotechnology Coordination Office Welcomes New Director

109(10):3688-3693

Probing and repairing damaged surfaces with nanoparticle-containing microcapsules
Nature Nanotechnology 7(2): 87-90

Additive-Driven Assembly of Block Copolymer-Nanoparticle Hybrid Materials for Solution Processable Floating Gate Memory
ACS Nano 6(2):1188-1194

Cooperative Assembly of Hydrogen-Bonded Diblock Copolythiophene/Fullerene Blends for Photovoltaic Devices with Well-Defined Morphologies and Enhanced Stability
Chemistry of Materials 24(3):622-632

Adsorption and Photochemical Properties of a Molecular CO2 Reduction Catalyst in Hierarchical Mesoporous ZSM-5: An In Situ FTIR Study
Journal of Physical Chemistry Letters 3(4): 486-492

Affiliated Centers

CHM
Center for Hierarchical Manufacturing
University of Massachusetts Amherst

Center for High-rate Nanomanufacturing

Center for Nanoscale Chemical-Electrical-Mechanical Manufacturing Systems

SINAM
CENTER FOR SCALABLE AND INTEGRATED NANOMANUFACTURING

The National Nanotechnology Coordination Office (NNCO) is pleased to announce the appointment of Dr. Robert Pohanka as the Director of the NNCO. Dr. Pohanka joins the NNCO after serving as the Director of the Defense Venture Catalyst Initiative (DeVenCI), where he led and directed the strategy for finding private sector technologies, developed independently of DoD, and transitioned them to DoD Research, Development and Acquisition.

"We are very pleased that Dr. Pohanka will be joining our team here at the NNCO," said Dr. Sally Tinkle, Deputy Director of the NNCO and EHS Research Coordinator. "Dr. Pohanka's proven success in technology transfer and commercialization will serve the NNI well and better position the NNI to capitalize on the tremendous promise of nanotechnology."
More....

Read more on InterNano

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